

### REMARKS

In the Office Action the Examiner rejected claims all claims 1-9 under 35 U.S.C. 103 for being obvious but also indicated that dependent claims 2 and 5 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 103, as set forth in this Office Action and to include all of the limitations of the base claim and any intervening claims. Claims 1-3 and 5-9 remain in the application.

The present invention thus provides a method for forming a diode integrated with a semiconductor device wherein the P and N regions of the device are formed by one blanket implant step into a dielectric layer, one implant step into a semi-conductive layer, such as a polysilicon layer, with a mask and a re-distribution step wherein the dopant from the dielectric layer is out-diffused into the polysilicon layer. The blanket implant and re-distribution step avoids the need for an additional implant and extra mask. This can provide significant cost savings for the final product.

Thus claim 1 of the present application requires:

- forming a dielectric layer over the layer of semiconductor material;
- introducing a first conductivity type dopant into the dielectric layer;
- introducing a second conductivity type dopant into a first region of the semi-conductive layer; and
- re-distributing the first conductivity type dopant from the dielectric layer into the semi-conductive layer so as to form a second region of the first conductivity type dopant in the semi-conductive layer, the second region being adjacent the first region so as to provide a P/N junction of the diode.

US 6,091,114 (Mogul) does not disclose any method steps for the manufacture of the device described and shown. In particular, no mention is made of introducing a dopant into a dielectric layer and re-distributing the dopant from the dielectric layer into the semi-conductive layer, as specified in claim 1, which avoids the need for an additional implant and extra mask, as mentioned above.

US 5,763,916 (Gonzalez) does not teach the missing elements of Mogul's disclosure. Although he refers to forming a dielectric layer, this is not part of the process of forming a diode but in order to form a capacitor. Again, no mention is made of introducing a dopant into a

dielectric layer and re-distributing the dopant from the dielectric layer into the semi-conductive layer, as specified in claim 1. Indeed, this process step would be incompatible with the formation of a capacitor that is the objective of Gonzalez. Therefore, it is submitted that the combination of Gonzalez with Mogul points away from the present invention, not towards it. Claim 1 is therefore submitted to be allowable.

Claims 2 to 8 are dependent on claim 1 and are submitted to be allowable, at least for this reason. In addition, the Examiner has already indicated that claims 2 and 5 are allowable subject to being written in independent form, as is now the case.

Similarly, claim 9 of the present application requires:

- forming a first dielectric layer over the layer of semiconductor material;
- introducing a first conductivity type dopant into the first dielectric layer;
- forming a second dielectric layer over the layer of semiconductor material in the active area;
- introducing a second conductivity type dopant into a semi-conductive layer over the active area and into a first region of the semi-conductive layer over the first dielectric layer;
- introducing a dopant of the first conductivity type into the layer of semiconductor material through openings in the active area;
- re-distributing the first conductivity type dopant from the dielectric layer into the semi-conductive layer so as to form a second region of the first conductivity type dopant in the semi-conductive layer, the second region being adjacent the first region so as to provide a P/N junction of the diode; and
- re-distributing the dopant of the first conductivity type in the layer of semiconductor material so as to form regions of the first conductivity type in the semiconductor material.

The manufacturing process implied (but not described) in US 6,091,114 (Mogul) for the transistor plus gated diode structure shown is compatible with the prior art technique referred to in the present application, which requires a mask and an implant for each diode region. Once again, no mention is made of introducing a dopant into a dielectric layer and re-distributing the dopant from the dielectric layer into the semi-conductive layer, which avoids the need for an additional implant and extra mask, as mentioned above. No mention is made in US 6,091,114 of

re-distributing the dopant of the first conductivity type in the layer of semiconductor material so as to form regions of the first conductivity type in the semiconductor material, which enables the first conductivity type for the diode to be made in a common operation with the dopant of the gate of the transistor.

Once again, US 5,763,916 (Gonzalez) does not teach the missing elements of Mogul's disclosure. Although he refers to forming a dielectric layer, this is not part of the process of forming a diode but in order to form a capacitor. Again, no mention is made of introducing a dopant into a dielectric layer and re-distributing the dopant from the dielectric layer into the semi-conductive layer, as specified in claim 9.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

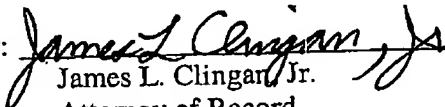
Applicants believe the application is in condition for allowance which action is respectfully solicited. Please contact the below-signed if there are any issues regarding this communication or otherwise concerning the current application.

Respectfully submitted,

SEND CORRESPONDENCE TO:

Motorola, Inc.  
Law Department

Customer Number: 23125

By:   
James L. Clingan, Jr.  
Attorney of Record  
Reg. No.: 30,163  
Telephone: (512) 996-6839  
Fax No.: (512) 996-6854  
Email: Jim.Clingan@Motorola.com